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Research Paper

AN EFFICIENT COLOR IMAGE ENCRYPTION AND LOSSLESS COMPRESSION SYSTEM USING SPIHT ARITHMETIC ENCODER

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This paper presents a novel watermarking mechanism for digital media that embeds a recognizable pattern into the spatial domain and an invisible image into the frequency domain. Undoubtedly, visible watermarking is important for protecting online resources from unauthorized reproduction. Lossless compression of encrypted sources can be achieved through SPIHT coding. For encrypted real-world sources, such as images, the key to improve the compression efficiency is how the source dependency is exploited. Lossless compression of encrypted color images can be achieved through arithmetic encoder. For encrypted real-world sources, such as images, the key to improve the compression efficiency is how the source dependency is exploited. This is color image encryption method where image is encrypted by specific rule that is rearrangement of image pixels. In this paper, we present color Image encryption and decryption by using partition and scanning pattern which is related to scan approach.

Keywords: Encrypted color images, SPIHT coding lossless compression, Image encryption and decryption

INTRODUCTION

Encryption is used to securely transmit data in open networks. Each type of data has its own features; therefore different techniques should be used to protect confidential image data from unauthorized access. Most of the available encryption algorithms are mainly used for textual data and may not be suitable for multimedia data such as images. For secure transmission, various compression and encryption techniques are proposed to satisfy a fast and secure transmission. However these two techniques must be studied separately. In this paper we propose a method combining encryption and compression based enhanced encryption and compression algorithms.

PROBLEM STATEMENT

The proposed algorithm uses binary codes and pixels inside an image. The file is used

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before it is converted to binary codes to maximize the storage of data inside the image. The system is then tested to see the viability of the existing algorithm. Various sizes of data are stored inside the images and the PSNR (Peak signal-to-noise ratio) is also captured for each of the images tested. Based on the PSNR value of each images, the image has a higher PSNR value.

METHODOLOGY

The algorithms proposed are:

Algorithm 1: (Image hiding – watermarking)

It is accomplished by using Inter block correlation side match vector quantization.

Algorithm 2: (Image Compression)

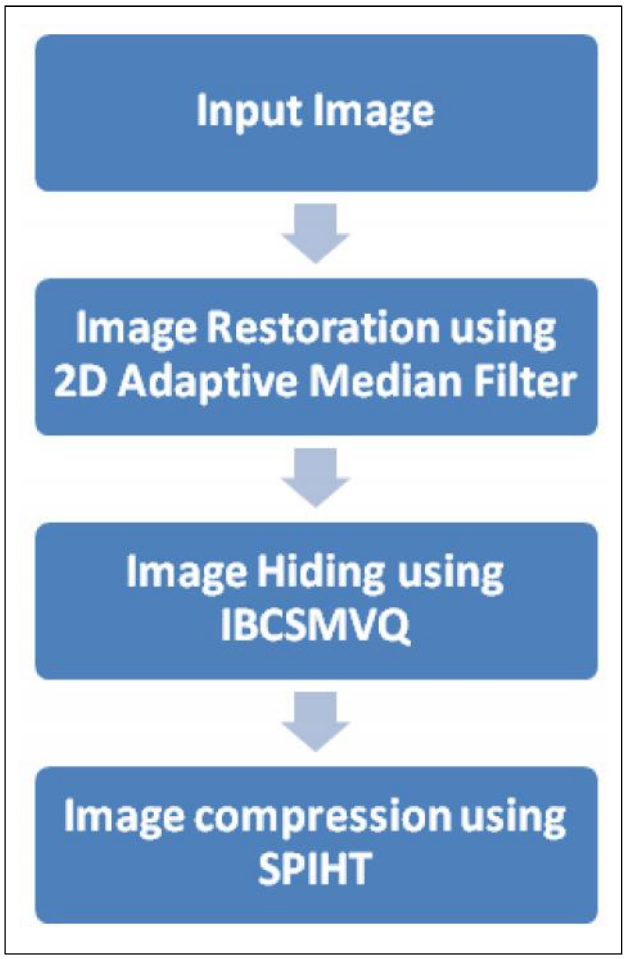


Image Compression is done by using SPIHT algorithm.

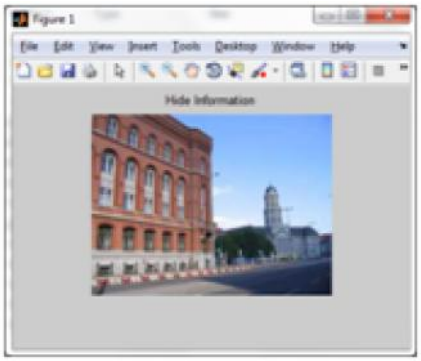
Image Hiding – Inter Block Correlation Side Match Vector Quantization

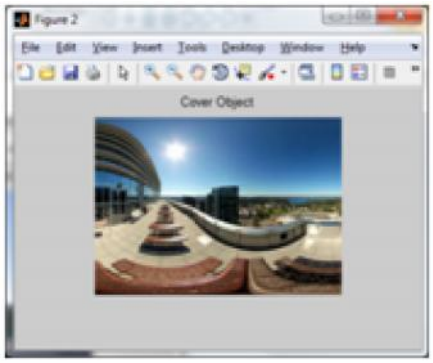
Since Inter Block Correlation Side Match Vector Quantization (IBCSMVQ) provides better image quality of reconstructed image and compression bit rate than Side Match Vector Quantization (SMVQ) does, it becomes another choice to compress the transmitting images when the bandwidth is limited. To expand the cover media for transmitting confidential information, we propose a novel data hiding scheme which embeds secret data into the IBCSMVQ-compressed image. In terms of the payload capacity, the visual quality, and the compression rate, experimental results confirm that the performances of our scheme are better than that of other information hiding schemes for SMVQ-based and IBCSMVQ-based compressed images. In addition, the embedded secret data can be extracted from the stego-image without referencing the original cover image.

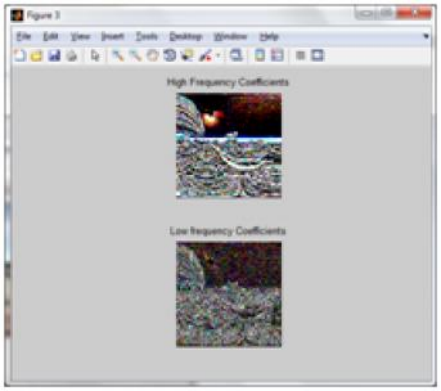
Image Compression

The traditional image coding technology uses the redundant data in an image to compress it. But these methods have been replaced by digital wavelet transform based compression method as these methods have high speed, low memory requirements and complete reversibility. Now in this work we are considering SPIHT as a placement for wavelet compression methods. We are comparing it with wavelet encoding scheme and comparing the final results in terms of bit error rate, PSNR and MSE.

Figure 1: Results







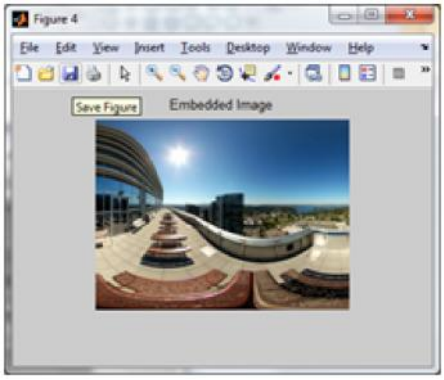
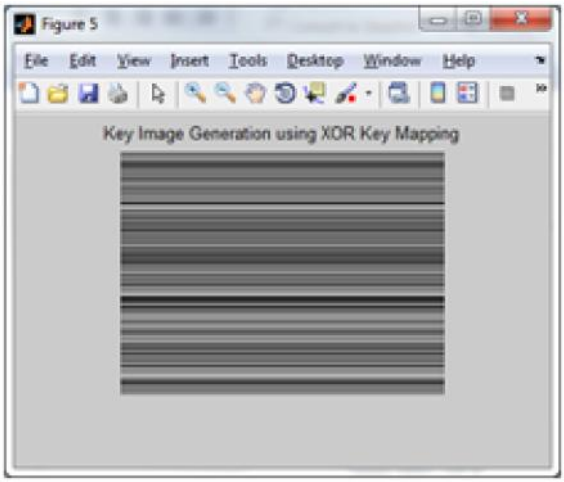
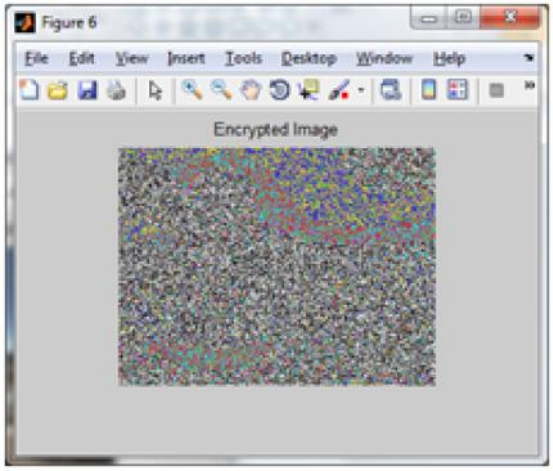


Figure 1 (Cont.)





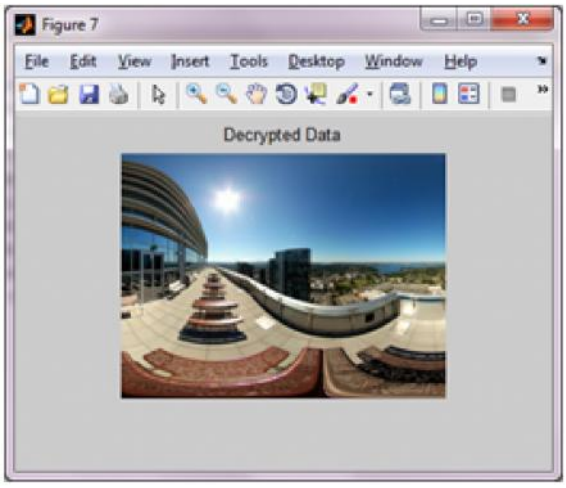
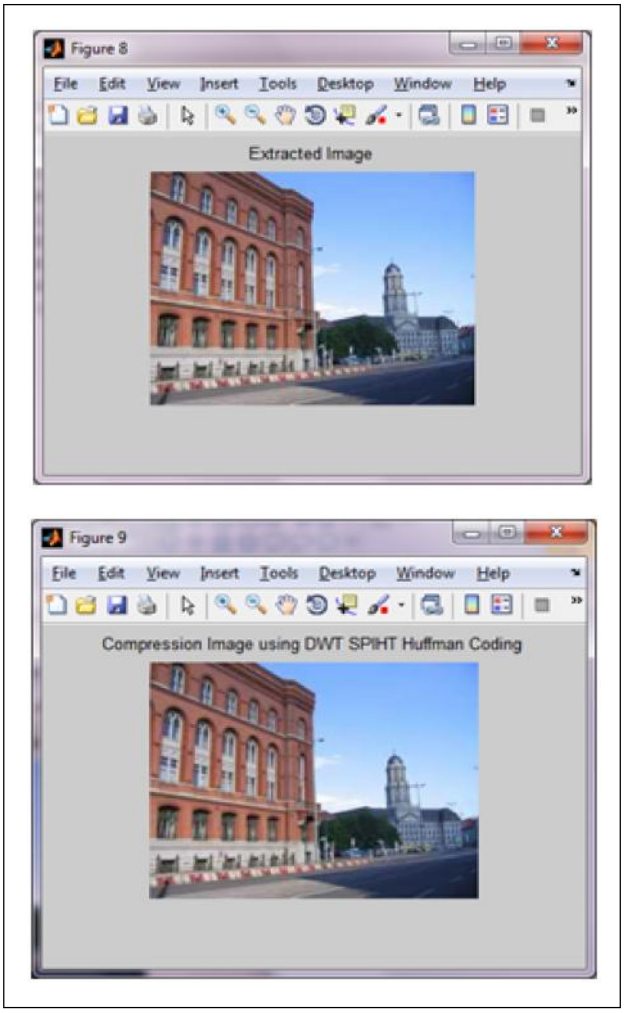


Figure 1 (Cont.)



DISCUSSIONS AND CONCLUSION

Modern image hiding studies the encoding and the detection of secret messages transmitted over digital communication platforms. Image hiding methods hide the presence of an arbitrary digital message by encoding it into other digital media, thus making its discovery by potential investigators very difficult. The importance of image hiding was recently reconsidered by governments with regard to Internet security.

Still the quality of the image remains same after the compression.

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